


25

PROCEEDINGS
OF THE
CALIFORNIA ACADEMY OF SCIENCES
FOURTH SERIES



VOL. XXI, No. 24, pp. 295-300.

SEPTEMBER 26, 1935

THE TEMPLETON CROCKER EXPEDITION OF THE
CALIFORNIA ACADEMY OF SCIENCES, 1932

No. 24

NEW SPECIES OF GRASSES FROM THE GALAPAGOS
AND THE REVILLAGIGEDO ISLANDS

BY

ALBERT SPEAR HITCHCOCK

Bureau of Plant Industry, United States Department of Agriculture
(With an introductory paragraph by John Thomas Howell)

During the course of the Templeton Crocker Expedition of the California Academy of Sciences in 1932, more than 250 specimens of grasses were collected in Mexico, Central America, and the Galapagos Islands by Mr. John Thomas Howell, botanist of the expedition. The entire collection was referred to Dr. A. S. Hitchcock, United States Department of Agriculture, who, with Mrs. Agnes Chase, kindly named the species. A full report on the grasses will accompany the account of the vascular plants of the expedition which is now being prepared. But, since several years will probably elapse before it is completed, descriptions of the new grasses found in the collection have been prepared for publication. The new species of *Trisetum* from the Galapagos Islands and the two new species of *Aristida* from the Revillagigedo Islands, Mexico, have been described by Dr. Hitchcock, while the new Galapagian species and variety of *Paspalum* have been named by Mrs. Chase.

J. T. H.

September 26, 1935

OCT 2 1935

Trisetum Howellii Hitchcock, spec. nov.

Perenne; culmi laxe caespitosi, erecti, tenues, glabri, 70 cm. alti, nodis multis; vaginae glabrae vel paullum pilosae; ligula 1-2 mm. longa; laminae planae, laxae, glabrae, 10-15 cm. longae, 1-3 mm. latae; panicula angusta, laxiuscula, 10-15 cm. longa, ramis tenuibus, laxe appressis, paucifloris, 1-3 cm. longis; spiculae 2-florae; rachilla pilosa; glumae aequales, angustae, acuminatae, 4 mm. longae, prima 1-nervia glabra, secunda 3-nervia quam prima latior, carina scabra; lemmata glabra tenuiter 5-nervia, callo breviter piloso, apice acuta, primum 3-3.5 mm. longum, secundum quam primum paulo minus, 1 mm. infra apicem aristam geniculatam circa 5 mm. longam exserentia.

Perennial; culms rather loosely cespitose, erect, slender, glabrous, several-noded, about 70 cm. tall; sheaths striate, glabrous or the lower sparingly short-pilose; ligule 1-2 mm. long; blades flat, lax, glabrous, or somewhat scaberulous on the upper surface, often somewhat bulged out on the margins at base, 10-15 cm. long, 1-3 mm. wide; panicle erect, narrow, rather lax, brownish or greenish, 10-15 cm. long, the axis slender, scaberulous or nearly glabrous, the slender branches loosely appressed, 1-3 cm. long, loosely flowered; glumes equal in length, narrow, acuminate, about 4 mm. long, the first 1-nerved, glabrous or slightly scabrous on the keel near the slightly awn-pointed tip, the second a little broader than the first, strongly 3-nerved, scabrous on the keel; florets 2, the slender rachilla joint pilose, 1 mm. long; first lemma 3-3.5 mm. long, faintly 5-nerved, glabrous, short-pilose on the callus, the hairs less than 0.5 mm. long, the apex rather firm, acute, the awn from about 1 mm. below the tip, geniculate, about 5 mm. long; second lemma similar to the first, smaller, the hairs at the summit of the rachilla joint below about 1 mm. long, the rachilla extending above about 1 mm., pilose, the hairs at summit about 1 mm. long.

Type: Herb. Calif. Acad. Sci. No. 211262, co-type in the U. S. National Herbarium, collected on Mt. Crocker, INDEFATIGABLE ISLAND, Galapagos Islands, March 9, 1932, *J. T. Howell No. 9208.*

Aristida tenuifolia Hitchcock, spec. nov.

Culmi dense caespitosi, tenues, 1 m. alti, nodis multis; ligula brevissima; laminae plerumque involutae, tenues, interdum basi planae (1-1.5 mm. latae), glabrae; panicula angusta, patula, 15-20 cm. longa, ramis ascendentibus, laxe paucifloris, inferioribus 5 cm. longis; glumae aequales, attenuatae, 10-12 mm. longae; lemma 1 cm. longum, apice minute scaberulo vix torto, callo 0.5 mm. longo dense et breviter piloso; aristae denique horizontaliter patulae, basi paulo tortae, laterales 1-1.5 cm. longae, media paulo longior.

Culms densely cespitose, with numerous innovations, slender, many-noded, about 1 mm. thick, about 60 cm. tall; sheaths glabrous, not keeled, bearing a few long hairs at the summit on each side of the blade; ligule very short, scarcely measurable; blades at first flat below and involute above, as much as 20 cm. long, those of the innovations closely involute, the flat base as much as 1.5 mm. wide, firm, bearing a few scattering long hairs, otherwise glabrous on both surfaces and margin, the margins and center thickened; panicles narrow, somewhat condensed, 15-20 cm. long, the axis slightly scabrous, the branches ascending, rather loosely few-flowered, the lower about 5 cm. long; glumes equal, attenuate to an awn-point, 10-12 mm. long, the first 3-nerved, scabrous on the nerves, the second weakly 3-nerved, glabrous; lemma about 1 cm. long, glabrous, minutely scabrous near the scarcely twisted summit, the callus slender, 0.5 mm. long, densely short-pilose; awns finally strongly or horizontally divergent, somewhat contorted at base, the lateral 1-1.5 cm. long, the central a little longer.

Type: Herb. Calif. Acad. Sci. No. 211473, co-type in U. S. National Herbarium, collected among rocks on ridge above Sulphur Bay, CLARION ISLAND, Revillagigedo Islands, March 23, 1932, J. T. Howell, No. 8361.

This species differs from *A. vaginata*, in its more slender culms about 60 cm. tall, its narrower mostly involute blades, with scattering long hairs on the upper surface near the base, and looser, shorter panicles. The spikelets are similar, though the awns are somewhat shorter and are finally widely spreading.

***Aristida vaginata* Hitchcock, spec. nov.**

Perennis; culmi caespitiosi, erecti, robusti, 1 m. alti, nodis multis; vaginae numerosae, imbricatae; laminae durae, planae, elongatae, supra scabrae, subtus glabrae, 1-4 mm. latae, longe attenuatae; panícula angusta, condensata, 20-30 cm. longa, ramis appressis; glumae paulo inaequales, longe attenuatae, circa 1 cm. longae, prima scabra, secunda glabra; lemma glabrum, 10-15 cm. longum, apice (2-3 mm.) leviter torto et scabro, callo dense et breviter piloso; aristae aequales, aequaliter patulae, 2-3.5 cm. longae, basi paulo contortae.

Culms caespitose, erect, many-noded, stout, about 2.4 mm. thick on the lower part, about 1 m. tall; sheaths overlapping, glabrous, tight, not at all keeled, broader than the base of the blade, the shoulder on each side obscurely pubescent and also villous with a few long hairs; ligule a firm short ciliolate membrane, less than 0.5 mm. long; blades of the culm firm, flat, glabrous beneath or obscurely pubescent near the base, strongly sulcate-striate and scabrous on the upper surface, elongate, as much as 4 mm. wide, long-attenuate and involute at tip; panicles narrow, condensed, about 30 cm. long, the axis scabrous, the branches, branchlets, and spikelets all appressed, the branches 5-8 cm. long, overlapping; glumes narrow, somewhat unequal, gradually narrowed into an awn-tip, the first about 1 cm. long, 3-nerved, more or less scabrous on the nerves, the second a little longer, weakly nerved, less scabrous; lemma slender, 10-15 mm. long, glabrous on the lower half, scaberulous above, the upper 2 to 3 mm. long, rather weakly twisted and lighter in color, the callus rather blunt, about 0.5 mm. long, densely short-pilose; awns about equally divergent, ascending, about equal in length, 2-3.5 cm. long, more or less contorted at base.

Type: Herb. Calif. Acad. Sci. No. 211474, co-type in U. S. National Herbarium, collected on dry slopes, north anchorage, SOCORRO ISLAND, Revillagigedo Islands, March 29, 1932, J. T. Howell No. 8448.

No. 8386 collected on the same island at Benner's Cove is somewhat less robust.

***Paspalum galapageium* Chase, spec. nov.**

Perenne, dense caespitosum; culmi 45-80 cm. alti, interdum basi racemos brevissimos sessiles ferentes; laminae planae, 15-25 cm. longae, 3-8 mm. latae, utrinque dense canescentes; racemi 2-8, ascendentes vel patentes, 3-6.5 cm. longi; rachis 0.6-0.8 mm. lata, scabra; spiculae binatae, 2-2.8 mm. longae, 1.5-1.8 mm. latae, ellipticae, subacutae; gluma prima interdum extans; gluma secunda et lemma sterile subaequalia vel gluma quam lemma brevior, 3-nervia, glabra; fructus 2-2.3 mm. longus, 1.5 mm. latus, laevis, nitens.

Perennial, grayish-olivaceous; culms 45 to 80 cm. tall, simple, leafy to the summit or nearly so, sometimes with a few to several few-flowered racemes of cleistogamous spikelets in the basal sheaths; sheaths mostly overlapping, from glabrous to finely canescent toward the summit, the margin sometimes ciliate; ligule fragile, 2 to 4 mm. long; blades flat, mostly 15 to 25 cm. long, 3 to 8 mm. wide, densely canescent on both surfaces, the pale midnerve prominent beneath; racemes 2 to 8, mostly 4 to 6, ascending to spreading, 3 to 6.5 cm. long, rather distant on a slender axis; rachis flexuous, 0.6 to 0.8 mm. wide, scabrous and with a tuft of long hairs at base; spikelets in pairs or the lower of the pair often undeveloped on flat scabrous pedicels, mostly not crowded, 2 to 2.8 mm. long (typically 2.3 to 2.8 mm.), 1.5 to 1.8 mm. wide, elliptic, subacute (the cleistogamous basal ones slightly larger, more turgid); first glume occasionally developed; second glume and sterile lemma subequal, or the glume somewhat shorter, 3-nerved, glabrous, mostly pale, sometimes obscurely speckled with pale brown; fruit 2 to 2.3 mm. long, about 1.5 mm. wide, pale, smooth and shining.

Type: Herb. Calif. Acad. Sci. No. 211105, co-type in U. S. National Herbarium, collected 3 miles south of the Equator, east side of ALBEMARLE ISLAND, Galapagos Islands, May 30, 1932, *J. T. Howell No. 9612.*

In the type specimen the visible basal cleistogenes are only 3, and are 3 mm. long, the other spikelets are 2.5 to 2.8 mm. long and the first glume is developed in occasional spikelets.

This species was described by Andersson as *Paspalum canescens* but since that name is preoccupied, Andersson's specimen incomplete, and his description inadequate, *Paspalum galapageium* is based on a new type instead of on *P. canescens* Anderss.

Paspalum canescens Anderss., Vet. Akad. Handl. Stockh. 1853: 132. 1855. Not *P. canescens* Nees, 1826. "Hab. in insula Abemarle [Albemarle] locis siccissimis elevatis." The type, collected by Andersson, was examined by A. S. Hitchcock in the Riksmuseets, Stockholm.

Of the ten collections referred to this species only three, the type and *Howell No. 8905* and *No. 9375A*, show the basal cleistogenes, but the Snodgrass & Heller and most of the Stewart collections show little or nothing of the base. The spikelets vary in size, even in individual plants, more than usual in *Paspalum*. In Andersson's type and in the three Howell collections mentioned above the spikelets range from 2.3 to 2.8 mm. long; in *Howell No. 9531*, and *Stewart No. 1310* they range from 2 to 2.5 mm., and in *Howell No. 9424* and *No. 9508*, and *Stewart No. 1309* and *No. 1319* from 2 to 2.3 mm. In all the blades are velvety-canescant.

Known only from the Galapagos Islands.

Albemarle Island: Tagus Cove, *Howell No. 9508*; *Snodgrass & Heller No. 198*. Tagus Cove Mountain, *Howell No. 9531*, *Stewart No. 1309* and *1319*. Iguana Cove, *Howell No. 9424*. East side, 3 miles south of the Equator, *Howell No. 9612.*

Charles Island: Black Beach, *Howell No. 8905*. Post Office Bay, *Howell No. 9375A*.

James Island: Sullivan Bay, *Howell No. 10019*.

Narborough Island: north side, *Stewart No. 1310*. South side, *Snodgrass & Heller No. 312*.

***Paspalum galapageium* var. *minoratum* Chase, var. nov.**

Laminae minores canescentes vel glabrescentes; racemi 2-6; rachis 0.5 mm. lata; spiculæ 1.5-1.8 mm. longae, 1.3-1.4 mm. latae, obovatae.

Culms ascending to spreading, 30 to 70 cm. tall; foliage mostly darker olivaceous, the blades less densely canescent to glabrescent; racemes 2 to 6, mostly arcuate-spreading, the rachis 0.5 mm. wide; spikelets 1.5 to 1.8 mm. long, 1.3 to 1.4 mm. wide, broadly obovate; glume and sterile lemma subequal, mostly more thickly spotted with pale brown.

Type: Herb. Calif. Acad. Sci. No. 211101, co-type in U. S. National Herbarium, collected at Academy Bay, INDEFATIGABLE ISLAND, Galapagos Islands, May 2, 1932, *J. T. Howell No. 9042*.

The type and most of the specimens assigned here might be considered specifically distinct, but the differences are in degree. Since the spikelets of the species vary so greatly it seems more reasonable to regard these smaller plants with smaller spikelets as a variety.

This form appears to be what Andersson (Vet. Akad. Handl. Stockh. 1853: 132. 1855) referred to *Paspalum longepedunculatum* LeConte, a very different species, known only from the United States. The Darwin and Macrae collections referred to *P. longepedunculatum* by Hooker (Linn. Soc. Trans. 20: 171. 1847) may, judging from his discussion, have included *P. galapageium*. No basal cleistogenes are found in any of the specimens referred to the variety, and in only a few spikelets of *Stewart's No. 1317* is a first glume developed.

Stewart's No. 1322, with spikelets 2 mm. long and glabrescent blades is intermediate.

Known only from the Galapagos Islands.

Albemarle Island: Iguana Cove, in bunches on sides of cliffs above the Cove, *Stewart No. 1317* and *1318*. Villamil, common at 3150 feet, *Stewart No. 1311*.

Charles Island: north side of Floreana Peak, *Howell No. 9321*.

Chatham Island: Wreck Bay, *Stewart No. 1321* and *1322*.

Indefatigable Island: Academy Bay, *Howell No. 9042*; "50 to 75 feet, only 4 or 5 clumps," *Svenson No. 59*; Mt. Crocker, *Howell No. 9226*.

***Paspalum redundans* Chase, spec. nov.**

Perenne, dense caespitosum; culmi erecti vel ascendentes, 70-90 cm. alti, basi racemos brevissimos numerosos breviter pedunculatos spicularum cleistogamarum ferentes; laminae planae, 5-20 cm. longae, 3-7 mm. latae, utrinque pilosae; racemi paniculae terminales 2-4, erecti vel ascendentes, 2.5-6 cm. longi; rachis 1.1-3 mm. lata, scabra; spiculae binatae subcrebrae, 4-5 mm. longae, 2.5-2.8 mm. latae, obovatae; gluma et lemma sterile subequalia, 5-nervia, glabra; fructus 4 mm. longus, 2.3-2.5 mm. latus, laevis, nitens.

Perennial; culms compressed, in dense tufts, erect or ascending, 70 to 90 cm. tall, simple, leafy nearly to the summit, with numerous short racemes of cleistogamous spikelets at base, some partly hidden in the basal bladeless sheaths, some on peduncles 1 to 7 cm. long; foliage olivaceous, somewhat purplish at base, the sheaths mostly overlapping, pilose toward the summit to nearly glabrous, the lower short, loose, bladeless; ligule fragile, about 2 mm. long; blades flat, 5 to 20 cm. long, 3 to 7 mm. wide (the uppermost much-reduced), finely papillose-pilose on both surfaces, the pale midnerve rather prominent beneath; racemes of the terminal panicles 2 to 4 (mostly 3), erect to ascending, 2.5 to 6 cm. long, on a slender but stiff channeled axis; rachis flexuous, 1 to 1.3 mm. wide, scabrous and usually with a few long hairs at base; spikelets in pairs on short flat scabrous pedicels, somewhat crowded, 4 to 5 mm. long, 2.5 to 2.8 mm. wide, obovate, turgid; glume and sterile lemma rather firm, subequal, 5-nerved (the marginal nerves sometimes obscure), glabrous, tinged with purplish brown; fruit about 4 mm. long, 2.3 to 2.5 mm. wide, grayish-tawny, smooth and shining; basal racemes 1 or 2 on short peduncles, of 2 to 6 spikelets.

Type: Herb. Calif. Acad. Sci. No. 211116, co-type in U. S. National Herbarium, collected on the north side of INDEFATIGABLE ISLAND, Galapagos Islands, June 9, 1932, *J. T. Howell* No. 9902.